

STUDIES ON CALIFORNIAN PLANTS. I.¹

H. M. HALL.

(WITH PLATE X)

SPECIES FROM SOUTHERN CALIFORNIA.

Frasera neglecta, n. sp.—Plant perennial, 3–6^{dm} high, with several slender terete glabrous stems arising from a single perpendicular tap root: leaves all opposite, thick and leathery, not at all succulent; the lowermost crowded, 13–18^{cm} long, 4.3–8.6^{mm} wide, interspersed with others only 5^{cm} or less long, tapering for nearly their whole length to the base which abruptly widens and unites with the opposite leaf to form a short sheath; the upper merely sessile by a broad base, those of the inflorescence gradually reduced to spreading or recurved linear-lanceolate acute bracts: inflorescence an elongated interrupted thrysus, the lower cymes on ascending peduncles 5–10^{cm} long, few-flowered, upper cymes short-peduncled or sessile and more densely flowered; pedicels varying from 1^{cm} in length to almost obsolete: sepals 4, lanceolate, cuspidate-acuminate, 6.5^{mm} long, the margins scarious: petals oblong, acute, 8.6–10.8^{mm} long, greenish-white, the veins purple; petaline gland replaced by a tubular nectary, which reaches from the base of the petal nearly to the middle where it appears on the inner surface as a circular cavity with an indenture on the upper side, the orifice surrounded by a raised membrane with finely divided margin forming a fringed border: stamens 4; filaments nearly as long as the petals, tapering from the broad base to the tip; anthers oval: ovary ovate, attenuate into the slender style which is as long as the stamens.

Collected at the head of Swarthout cañon, San Antonio mountains, altitude 2070^m, June 1900, 1495 *Hall* (type); Holcomb valley, San Bernardino mountains, August 1882, *Parish*; Rock creek, San Gabriel mountains, July

¹Contributions from the Botanical Laboratories of the University of California.

1893, *Davidson*. All these localities are on the north slope of the San Bernardino range. The specimens from Holcomb valley are not as thrifty as the type; the flowers are somewhat smaller and the leaves (all under 7^{cm}) are principally from the base, leaving the long internodes exposed. The type is in the Herbarium of the University of California.

This plant has been confused with *Frasera nitida* Benth., but it differs from that more northern species in the more open inflorescence, the more slender and acuminate leaves and bracts, and above all by the absence of the petaline gland, which in *F. nitida* is narrowly oblong and open for its whole length. The nectary in the proposed species is a pocket-like organ inserted within the tissues of the lower part of the petal, the opening surrounded by a narrow flap with ciliate margin. The raised tissues over the lower part of the nectary are ordinarily brown in color.

EXPLANATION OF PLATE X.—*Fig. 1.* A plant from a single root; $\times \frac{1}{2}$. *Fig. 2*, a flower; $\times 1$. *Fig. 3*, petal showing nectary; $\times 2$. *Fig. 4*, longitudinal section through petal and nectary; $\times 2$. *Fig. 5*, a stamen; $\times 2$.

ASCLEPIAS CALIFORNICA Greene, *Erythea* 1:92. *Acerates tomentosa* Torr. Two well-marked forms of this species are found in Southern California. In the more common form the leaves are broadly ovate and distinctly petioled, while the pedicels are short. The extreme of this form comes from Lytle creek cañon, altitude 1830^m, and has leaves 5–6.2^{cm} wide by 7.6^{cm} long, while the pedicels are all under 2^{cm} in length.

The second form has oblong-lanceolate slenderly acuminate sessile leaves and elongated pedicels. The extreme of this form was collected along the Temecula river and has leaves 5^{cm} wide by 15^{cm} long, while the spreading pedicels are 3^{cm} in length.

That these forms do not deserve even varietal rank is shown by the fact that many intermediate forms exist, and one may pass from one extreme to the other by merely ascending a few thousand meters on some of the mountain slopes. At 914 meters in Cajon pass the slender-leaved form prevails, while in passing up the mountains west of the pass various forms are encountered until the extreme of the broad-leaved form is met at 1830 meters.

Gilia modesta, n. sp.—Plant annual, 15^{cm} high or less, divaricately branching from near the base, the branches ascending, either glabrous or sparingly pubescent: leaves mostly opposite below, the upper alternate, 1^{cm} long, palmately 3–7-divided

nearly to the base into rigid linear pungent-tipped lobes, these with strong midribs: flowers disposed singly or in pairs in the forks where they are short pedicellate, and clustered at the ends of the branches where they may be either sessile or short pediceled: bracts similar to the leaves but lobes usually only three, sparingly beset with loose cobwebby hairs: calyx pubescent, 8–11^{mm} long, about equaling the bracts, cylindrical with acute base, hyaline membranous with green ribs prolonged beyond the hyaline portion into pungent-tipped nearly equal lobes which are 2^{mm} or so long: corolla white, with the tube and throat yellow and with two purple lines at the base of each lobe; tube short; throat funnelform, 6–8^{mm} long, nearly equaled by the broadly obovate spreading lobes: stamens equally inserted near the base of the corolla tube, unequal in length, included: ovules in each cell 2 or 3; seeds oblong, developing spiracles only sparingly when wetted.

Gravelly hillsides of Lytle creek cañon along the trail to San Antonio peak, altitude 1830^m, June 1, 1900, 1443 *Hall* (type); Swarthout cañon, San Antonio mountains, altitude 2000^m, June 3, 1900; near Bear valley, San Bernardino mountains, altitude 2000^m, July 16, 1899. The type is in the Herbarium of the University of California.

This species is most nearly related to *Gilia demissa* Gray, but is easily distinguished from that by a number of important characters. *G. modesta* is a much larger plant, with a corolla fully 13^{mm} long, and nearly as wide when expanded, while *G. demissa* has a corolla only 6.5^{mm} long. The proposed species has a calyx of 5 narrow green ribs of equal width throughout, between which is stretched a hyaline membrane connecting them for three fourths their length, while *G. demissa* has a calyx of 5 lanceolate nearly distinct segments each with a scarious margin. The lobes of the leaves and bracts are more slender and rigid than in *G. demissa*, and the ovules are never more than three in each cell, as against seven in *G. demissa*. From *G. Parryæ* Gray it differs in many respects, principally in the absence of scales at the base of the corolla lobes. The general appearance suggests relationship with the members of the *Linanthus* section, but it differs from all those in the pubescence, in the funnelform corolla, in the small number of ovules, and in other characters.

COLLINSIA CALLOSA Parish, *Erythea* 7:96, Richardson's ranch near Manzana in Antelope valley, May 1896, 2503 *J. Burt Davy*. This was probably the first collection of this rare plant, the

original description being drawn from specimens collected in the San Antonio mountains, June 1899.

CHÆNACTIS XANTIANA Gray. This species is well distributed along the mountains surrounding the western part of the Mohave desert, often at altitudes of 1800–2000^m. An exceedingly robust form has been collected at Manzanita in Antelope valley, altitude 780^m, by *Mr. J. Burrill Davy* (no. 1512, May 1896). The stout fistulose stems are 3^{dm} high and terminated by heads 2^{cm} high; involucre bracts slenderly acuminate, 2^{cm} long; the inner pappus when fully developed longer than the corolla. It is hoped that collectors visiting that region may secure more material in order that the relation between this and the typical form may be more clearly understood.

CHÆNACTIS HETEROCARPHA CURTA Gray. Near Estrella in the Coast ranges of San Luis Obispo county, *L. Jared*. In these specimens the paleae of the pappus are reduced to mere rounded scales, which form a crown about the summit of the akene.

A TRIP TO THE SOUTHERN HIGH SIERRAS.

During the summer of 1900 Mr. H. P. Chandler and the writer spent some two months botanizing in the Sierras of Fresno county. Our first stop was at Ockenden, a small settlement on the ridge between the Kings and San Joaquin rivers, and well within the coniferous forests. Reaching here on June 12 we found the season just opening, many of the species still being in too young a condition to make good herbarium specimens.

After spending two weeks in that region we followed the trail to Tehipite valley, making side trips to the Dinkey grove of big trees and Bald mountain *en route*. Tehipite valley is a deep gorge several miles wide on the Middle fork of the Kings river. The floor of the valley is 1220^m in altitude, while the walls rise to over 2100^m. The flora was somewhat similar to that of the foothill region, and when we reached the valley (July 6) many of the annuals had already passed out of flower.

The Mount Goddard region was also visited, the route leading by Black mountain, Blaney meadows, and the South fork of

the San Joaquin. On July 24 we camped at the very base of the mountain just above timber line. The only shrub seen here was *Salix glauca villosa*, but hardy thick-rooted perennials grew abundantly around the lakes, and fifty-seven species were gathered above 3350^m. Thirty-three of these were also found below timber line, leaving twenty-four strictly alpine species. Ascending the peak the vegetation grew more and more scanty, until at 4000^m only *Draba Breweri*, *Erigeron compositus*, and *Polemonium confertum* remained, while on the very summit, at 4130^m, the *Polemonium* was the sole representative of the whole series of phænogamous plants.

The following species collected on this trip seem worthy of note.

ERIGERON BLOOMERI Parish, *Erythea* 6:87. Not rare in Tehipite valley, July 7, *Hall & Chandler*, no. 513. Determined by Mr. S. B. Parish.

ERIOGONUM NUDUM Dougl. An alpine form was collected near Mount Goddard at 3100^m. The slender stems are not over 2^{dm} high and are nearly always simple and monocephalous, July 1900, *Hall & Chandler*, no. 662.

AQUILEGIA PUBESCENS Coville, *Contrib. U. S. Nat. Herb.* 4:56. Among rocks on Mount Goddard at 3660^m, July 1900, *Hall & Chandler*, no. 671.

DODECATHEON JEFFREYI *redolens*, n. var.—Exceedingly robust, 4.5–6^{dm} high, the herbage redolent with a strong odor: leaves erect, lanceolate or spatulate, 2.5–4^{dm} long including the slender winged petiole: inflorescence glandular pubescent: flowers invariably 5-merous: lower part of stamens and capsule included in the corolla tube, which is not closely reflexed.

Along the lakes at the base of Mt. Goddard, 3400^m, July 25, 1900, *Hall & Chandler*, no. 676. Type in the Herbarium of the University of California.

This variety is easily distinguished in the field by the rank odor and by the shape of the corolla. The folding of the latter takes place well up on the tube, thus making the yellow band very prominent, while the purple ring at the base of the corolla in the species is lacking in the variety.

ERIGERON SALSUGINOSUS Gray. This plant, not rare at middle



HALL on FRASERA NEGLECTA, n. sp.